



INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS

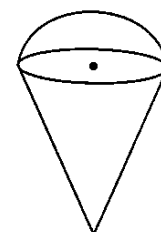
12.Surface Area and Volumes

Name: _____

Date: _____

Class: X Sec: ____

- The total surface area of solid hemisphere of radius r is
(A) πr^2 (B) $2\pi r^2$ (C) $3\pi r^2$ (D) $4\pi r^2$
- The radius of the base of a right circular cone and the radius of a sphere are each 5cm in length. If the volume of the cone is equal to the volume of the sphere then the height of the cone is:
a) 5cm b) 20cm c) 10cm d) 4cm
- The volume of a solid hemisphere is $\frac{396}{7} \text{ cm}^3$. The total surface area of the solid hemisphere (in sq.cm) is
a) $\frac{396}{7}$ b) $\frac{594}{7}$ c) $\frac{549}{7}$ d) $\frac{604}{7}$
- A solid is of the form of a cone of radius 'r' surmounted on a hemisphere of the same radius. If the height of the cone is the same as the diameter of its base, then the volume of the solid is :
(a) πr^3 (b) $\frac{4}{3} \pi r^3$
(c) $3\pi r^3$ (d) $\frac{2}{3} \pi r^3$
- A juice seller was serving his customers using glasses as shown in the figure. The inner diameter of the cylindrical glass was 5.6cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of the glass was 10cm, find the apparent capacity and the actual capacity of the glass.
- Find the volume of a right circular cone whose area of the base is 156 cm^2 and the vertical height is 8cm.
- An empty cone is of radius 3cm and height 12cm. Ice-cream is filled in it so that lower part of the cone which is $\left(\frac{1}{6}\right)^{\text{th}}$ of the volume of the cone is unfilled but hemisphere is formed on the top. Find volume of the ice-cream.

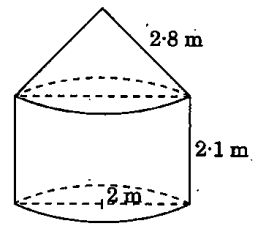


- A room is in the form of cylinder surmounted by a hemi-spherical dome. The base radius of hemisphere is one-half the height of cylindrical part. Find total height of the room if it contains $\left(\frac{1408}{21}\right) \text{ m}^3$ of air.

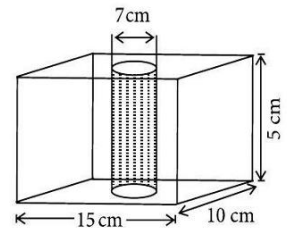


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9. In the given figure, a tent is in the shape of a cylinder surmounted by a conical top. The cylindrical part is 2.1 m high and conical part has slant height 2.8m. Both the parts have same radius 2m. Find the area of the canvas used to make the tent.



10. A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is $166\frac{5}{6} \text{ cm}^3$. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of ₹10 per cm^2 .
11. A solid is in the shape of a cone surmounted on a hemisphere. The radius of each of them being 3.5cm and the total height of the solid is 9.5cm. Find the volume of the solid.
12. In the given figure, from a cuboidal solid metallic block, of dimensions 15cm x 10cm x 5cm, a cylindrical hole of diameter 7cm is drilled out. Find the surface area of the remaining block.



13. **Case Study 1:**

A wooden toy contains a cuboidal wooden block of dimension $14\text{cm} \times 17\text{cm} \times 4\text{cm}$. On its top there are seven cylindrical hollows for bees to fit in. Each cylindrical hollow is of height 3cm and radius 2cm.

Based on the above, answer the following questions:

- Find the volume of wood carved out to make one cylindrical hollow.
- Find the lateral surface area of the cuboid to paint it with green colour.
- A) Find the volume of wood in the remaining cuboid after carving out seven cylindrical hollows.

OR

- Find the surface area of the top surface of the cuboid to be painted yellow.

14. **Case Study 2:**

Metallic silos are used by farmers for storing grains. Farmer Girdhar has decided to build a new metallic silo to store his harvested grains. It is in the shape of a cylinder mounted by a cone.

Dimensions of the conical part of a silo is as follows:

Radius of base = 1.5m

Height = 2m

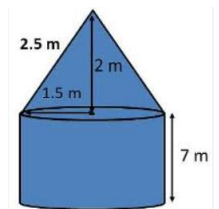
Dimensions of the cylindrical part of a silo is as follows:

Radius of base = 1.5m

Height = 7m

On the basis of the above information answer the following questions.

- Calculate the slant height of the conical part of one silo.





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- ii) Find the curved surface area of the the conimcal part of one silo.
- iii) A) Find the cost of metal sheet used to make the curved cylindrical part of 1 silo at the rate of ₹2000 per m^2 .
B)Find the total capacity of one silo to store grains.

15. Case Study 3:

Rinku was very happy to receive a fancy jumbo pencil from his best friend Rohan on his birthday. Pencil is a basic writing tool, when sharpened its shape is a combination of cyinder and cone as given in the picture. Cylindrical pencil with a conical head is a common shape worldwide since ages. Commonly pencils are made up of wood and plastic but we should promote pencils made up of eco-friendly material to save environment.



The dimensins of Rinku's pencial are given as follows:

Length of clindrical portion is 21cm. Diameter of the base is 1cm and height of the conical portion is 1.2cm.

Based on the above information, answer the following:

- i) Find the slant height of the sharpened part.
- ii) Find curved surface area of sharpened part in terms of π .
- iii) A)Find the total surface area of the pencil in terms of π .

OR

B)The pencil's total height decreases by 8.2cm after sharpening it many times, what is the volume of the cylindrical part of the shortened pencil in terms of π ?

16. Case study 4:

In a coffee shop, coffee is served in two types of cups. One is cylindrical in shape with diameter 7cm and height 14cm and the other is hemispherical with diameter 21cm.



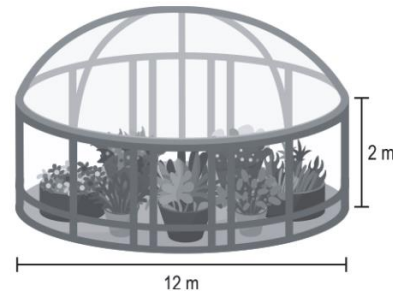
Based on the above information, answer the following:

- i) Find the area of the base of the cylindrical cup.
- ii) A)What is the capacity of the hemispherical cup?
OR
B)Find the capacity of the cylindrical cup.
- iii) What is the curved surface area of the cylindrical cup?

17. Dinesh is building a green house in his farm as shown below. The base of the green house is curcular having a diameter of 12m and it has a hemispherical dome on top. How much will it cost to cover the walls and top of the green house with transparent plastic, if the plastic sheet costs ₹77 per sqm?



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18. A paint roller is a paint application tool used for painting large flat surfaces rapidly and efficiently. One such roller is shown below, which is 26cm long with an outer diameter of 7cm. Find the maximum area of the surface that gets painted when the roller makes 6 complete rotations vertically.

